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(54) Title: DISPERSED SYSTEMS AND METHOD OF MANUFACTURE (57) Abstract Oleaginous substances such as vegetable oil, baby oil, olive oil, margarine, lanolin, cocoa butter and the like have their affinity for water altered by mixing the oleaginous substance with sugar and melt spinning the mixture in a cotton candy spinning machine or the equivalent. As so modified the product disperses autogenously in water forming a colloidal or colloidal-like dispersion. The modification enables such widely disparate procedures as incorporating shortening oil in a cake mix containing flour but no egg, producing a confection or medicated lozenge by dehydrating the dispersion and allowing the melted residue to solidify.		

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DISPERSED SYSTEMS AND METHOD OF MANUFACTURE

BACKGROUND OF THE INVENTION

The application is a continuation-in-part of
5 application Serial No. 169,838, filed March 18, 1988, which
is a continuation-in-part of application Serial No. 040,371,
filed April 20, 1987. A related application is Serial No.
169,914, filed March 18, 1988.

The present invention relates to methods of
10 producing colloidal or colloidal-like dispersions, the
products so produced, and to the products used to produce
the dispersions. It also relates to methods of diminishing
the lack of affinity as between various substances that
normally lack affinity for one another. In the prior
15 applications mentioned above, various substances having
pharmacological and or cosmetic properties were combined
with a sugar and spun into fibers to produce a readily
water-soluble product. The various examples enumerated in
the prior applications all involved the use of water soluble
20 medicaments and cosmetic substances and were directed to
enhancing the solubility rate of the different substances.
As an outgrowth of experimentation with a varied catalog of
substances it has been discovered that spinning a substance
with sugar can alter the medium in which a particular
25 substance can either dissolve or become dispersed, the
latter while forming a colloid or colloidal-like dispersion.
Whether or not the dispersions to be described herein
represent true colloidal dispersions or only pseudo-
colloidal dispersions, has yet to be determined. What is
30 evident is that when the spun sugar products to be described
herein are added to water, the product disperses
autogenously throughout the water and remains dispersed. In
most instances one observes a general cloudiness associated
with a colloidal suspension. But this is not always the
35 case. Several other novel phenomena have been observed also.

Water and oil normally do not mix. In fact, all
oleaginous substances are, in the absence of a surfactant or
emulsifier, considered immiscible in water. Also, there are
many substances that are soluble in water but considered

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insoluble in oleaginous materials and lack affinity for such materials. Examples are glycerin and polyethylene glycol. However, one can think of situations where combining such substances might be desirable. For example, combining
5 glycerin with an oil based medicament product in a cough syrup.

SUMMARY OF THE PRESENT INVENTION

It is, therefore, an object of the present
10 invention to provide a method for rendering a hydrophobic substance dispersable in water without the use of any presently recognized surfactant or emulsifier.

It is another object of the present invention to provide a product containing a normally hydrophobic
15 substance which product is autogenously dispersable in water to form a colloidal or colloidal-like dispersion.

Yet another object of the present invention is to provide a colloidal or colloidal-like dispersion containing water, at least one oleaginous substance and optionally one
20 or more adducts which in their separate state are soluble in water but lack affinity for said oleaginous substances, all without the use of any presently recognized surfactant or emulsifier.

Another object is to enable single or multiple
25 substances to be combined in the presence of water without the need for an emulsifier or surfactant even though such substances normally lack affinity for one another or for the water.

Other objects will occur to those skilled in the
30 subject art after reading the following detailed description.

In accordance with one aspect of the present invention there is provided A mass of spun fibers consisting essentially of one or more sugars where the sugars are
35 capable of being spun into fibers that are readily water-soluble, and an ingredient that in its separate state is hydrophobic, said ingredient being distributed on or incorporated in the fibers of said mass such that said mass of fibers when added to water disperses therein to form a

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colloidal or colloidal-like dispersion.

In accordance with another aspect of the present invention there is provided a colloidal or colloidal-like dispersion consisting essentially of water, at least one
5 oleaginous substance, at least one sugar that is water-soluble, and optionally one or more adducts which in their separate state are soluble in water but lack affinity for said oleaginous substances.

In accordance with a further aspect of the present
10 invention there is provided a method of rendering a hydrophobic substance dispersible in water which comprises the steps of mixing said substance with a sugar capable of being spun into fibers that are readily water-soluble, and thereafter processing said mixture with a floss producing
15 machine to yield a mass of material that when added to water disperses therein to form a colloidal or colloidal-like dispersion.

In accordance with yet another aspect of the present invention there is provided a method of producing a
20 dispersion which is colloidal or colloidal-like and contains, in addition to water, at least one oleaginous substance, said method comprising the steps of mixing said substance with at least one sugar capable of being spun into fibers that are readily water-soluble, thereafter processing
25 said mixture of substance and sugar using a floss producing machine to yield a mass of product, and introducing said product into a quantity of water thereby producing said dispersion.

The invention will be better understood after
30 reading the following detailed description of the presently preferred embodiments thereof.

DETAILED DESCRIPTION OF THE PRESENTLY PREFERRED EMBODIMENTS

Co-pending application Serial No. 169,838-

35 describes methods for combining a medicament with any one or more of the water soluble melt spinnable sugars and spinning the combination to produce a readily soluble floss form of the medicament. The disclosure of such application is incorporated herein by reference.

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Typical of the discovery that has given rise to the present application is that any oleaginous substance that can be mixed with a melt-spinnable sugar, when spun in a cotton candy spinning machine, produces a product which, when added to water or has water added to it, forms, virtually autogenously, a uniform dispersion having all the appearances of a colloidal dispersion. An attempt to measure the size particles in such dispersion has indicated that the particles are usually no greater than about 1.0 micron. The invention can best be described and understood from a consideration of a number of examples.

For the following examples the floss spinning machine used was: Econo floss Model 3017 manufactured by Gold Medal Products Co. of Cincinnati, Ohio. Unless otherwise stated, reference to sucrose in the examples is to "Gold Medal" flossugar, Jolly Berry flavor. Unless otherwise indicated, the temperature of the grid in the spinning machine was about 180°F. (82.2°C.) while the operating speed was about 3800 R.P.M.

EXAMPLE I

A quantity of sucrose was placed in a receptacle along with a quantity of "Bertolli" brand 100% pure olive oil, classico, in the ratio by volume of 4 parts sucrose to 2 parts oil. The material was stirred with a spoon and left to stand for 10 minutes, stirring again after 5 minutes and at the end of the 10 minute interval. The mixture was then spun in the floss spinning machine at the heat setting normally used for the sucrose alone. A luxurious, soft and dense floss, having the odor of olive oil was produced. When a quantity of the floss was placed in a beaker of clear water, the floss appeared to disperse rapidly creating a dispersion that was no longer clear. Left overnight the dispersion appeared unchanged, still uniformly cloudy.

EXAMPLE II

A quantity of unmodified sucrose was spun in the floss spinning machine at the same conditions as in Example I and a quantity of the resultant floss was placed in a

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beaker with clear water. While the floss disappeared in the water, the water remained perfectly clear, that is, the sugar went into true solution.

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EXAMPLE III

The procedure of Example I was repeated substituting for the olive oil a similar quantity of "Johnson & Johnson" Baby Oil. Except for the expected difference in odor, the resultant dispersion in water was the same.

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EXAMPLE IV

A quantity of floss produced in Example I was left exposed to the environment in a humid atmosphere for a period of 12 hours with no evidence of deterioration. Floss produced without an oil additive shows evidence of deterioration after a relatively short exposure to a moist atmosphere. It can be understood from this that the oil content serves as a stabilizer for the floss, yet the product disperses readily when added to an aqueous medium.

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EXAMPLE V

A quantity of the floss produced in Example I was placed in water in a vessel in the weight ratio of approximately 10% floss to water. The mixture was heated to boiling and removed from the heat. When placed in a clear receptacle the liquid was still cloudy retaining its dispersed condition. The liquid was then placed in a freezer at 20°F. (-6.6°C.) and gradually turned to ice after a prolonged mush stage. The ice remained cloudy. It was then melted in a microwave oven and returned to its original appearance of a colloidal or colloidal-like dispersion.

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EXAMPLE VI

The procedure of Example I was repeated with each of the below-listed oleaginous substances with precisely the same results, except that the quantity of sucrose varied between 4 and 5 parts by volume to 2 parts oleaginous substance.

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- (a) "PEOPLES" pure imported Cod Liver Oil.
 - (b) "SQUIBB" Mineral Oil.
 - (c) "NATURE MADE" B-6 complex containing kelp, lecithin and vitamin B-6 with cider vinegar.
 - 5 (d) "FLEISCHMANS" 100% Corn Oil Margarine.
 - (e) Lard manufactured by Smithfield Packing Co.
- The lard and margarine were first melted in a microwave oven. The B-6 complex, substance (c), was in capsule form and was ground in a coffee grinder and mixed with the
- 10 sucrose with the addition of a small quantity of water.

EXAMPLE VII

The procedure of Example I was repeated with "Quaker State" 10W-40 Motor Oil, 1 part by volume oil to 3 parts

15 sucrose. The grid temperature of the spinning machine had to be lowered slightly to eliminate mild smoking. The floss appeared silky, heavy and very tough. Actually, the fibers produced by this example appear strong enough to be taken up on a spool.

20

EXAMPLE VIII

The procedure of Example I was repeated to produce a floss from "CRISCO" 100% Vegetable Oil using 1 part by volume oil to 2.5 parts sucrose. A very silky floss was

25 produced with strong tough fibers. When placed in water a colloidal or colloidal-like dispersion resulted.

EXAMPLE IX

A floss was produced by placing in a bowl 1/3 cup of

30 a Lactose obtained from Sigma Chemical Co. of St. Louis, Missouri, along with 1/8 cup of "CRISCO" 100% Vegetable Oil. The mixture was stirred with a spoon for 2 minutes and then spun at a grid temperature of approximately 200°F. (93.3°C.). The floss quickly formed a dispersion when added

35 to water.

EXAMPLE X

For this example the materials used were sucrose obtained from Victor Products Co. of Richmond, Virginia, and

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polyethylene glycol, m.w. 400, (P-3265) from Sigma Chemical Co. 1/3 cup of sucrose was mixed with 1/8 cup of the polyethylene glycol. The ingredients were stirred for 2 minutes and spun. The resulting floss when added to water is believed to form a dispersion and not a solution. Based upon other experiments described in Examples below it is certain that the polyethylene glycol is modified by the processing with sugar. However, when it is added to water, because of the clarity of the liquid it is difficult to discern a difference from the solution that is formed when pure polyethylene glycol is added to water. With heavy loading the water begins to show some cloudiness.

EXAMPLE XI

Floss produced in Example X was added to a quantity of "CRISCO" 100% Vegetable Oil but would not go into solution or disperse within the oil.

EXAMPLE XII

1/8 cup of the polyethylene glycol floss produced in Example X was added to 1/3 cup of water producing an apparent dispersion. Next, 1/8 cup of the Vegetable Oil floss produced in Example VIII was added to 1/3 cup of water and produced a dispersion. When the two dispersions were mixed a colloidal or colloidal-like dispersion was formed with no evidence of any constituent settling out. Thus, the polyethylene glycol, normally immiscible in oil, was enabled to enter into an intimate dispersion along with the oil.

The unusual behavior and modification of polyethylene glycol and vegetable oil reported in Examples X, XI and XII, does not appear to be limited to those substances. Similar behavior was evidenced with glycerin (glycerol) and is described in the examples that follow.

EXAMPLE XIII

To 1/3 cup of sucrose from Victor Products Co. was added 1/8 cup of glycerin USP distributed by Barre-National Inc. of Baltimore, Maryland. The mixture was stirred with a spoon in a bowl for three minutes and was then spun into

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fibers. Mild initial smoking was corrected by slightly lowering the grid temperature. A good textured floss was produced. When 1/8 cup of the floss was placed in water it formed a dispersion similar to that discussed in Example X and not a solution as would be expected from sugar and glycerin individually. Similar to Example XI, the glycerin floss would not mix with pure vegetable oil. Also, pure glycerin does not mix with pure vegetable oil nor does it mix readily with water that already contains glycerin floss.

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EXAMPLE XIV

Now, 1/8 cup of the vegetable oil floss produced in Example VIII and 1/8 cup of the glycerin floss produced in Example XIII were placed together in a clear vessel and to this was added 1/3 cup of water. Immediately, the two flosses dispersed in the water to form a colloidal or colloidal-like dispersion.

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EXAMPLE XV

To verify the parallel responses, a quantity of vegetable oil floss as produced in Example VIII was added to the glycerin USP but would not mix. Then 1/8 cup of glycerin floss as formed in Example XIII was added to 1/8 cup of pure vegetable oil along with 1/3 cup of water. No mixing or blending occurred.

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EXAMPLE XVI

To 1/8 cup of glycerin floss as produced in Example XIII was added a quantity of water and this produced an apparent dispersion. To the dispersion was added a quantity of pure vegetable oil. The oil remained layered. Next, 1/2 cup vegetable oil floss as produced in Example VIII was added to 1/3 cup of water. A dispersion was formed immediately. Thereafter, 1/8 cup of glycerin was added to the dispersion and no blending could be obtained. However, reversing the sequence and mixing the pure glycerin first with water produced a solution (associated with a slight shimmering appearance as the glycerin spreads) in which the vegetable oil floss dispersed when subsequently added.

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EXAMPLE XVII

Example XIV was repeated using 1/10 cup each of vegetable oil floss and glycerin floss to which was added 1/3 cup water. Result, immediate dispersion formed having all the appearance of a colloidal dispersion.

EXAMPLE XVIII

1/6 cup of vegetable oil was mixed with 1/3 cup water to which was added 1/10 cup polyethylene glycol. While the polyethylene glycol appeared to enter a dispersed state, the vegetable oil remained separated in globules.

EXAMPLE XIX

Next, 1/10 cup of glycerin floss was added to a mix of 1/6 cup of water and 1/6 cup vegetable oil. The glycerin formed a dispersion but the oil remained in separate globules.

EXAMPLE XX

1/10 cup of mineral oil floss from Example VI was combined in a vessel with 1/10 cup of polyethylene glycol floss from Example X and 1/10 cup of vegetable oil floss from Example IX. To this combination was added 1/2 cup water resulting in an immediate uniform dispersion.

EXAMPLE XXI

To 1/10 cup vegetable oil floss from Example IX was added a previously prepared mixture of 1/10 cup polyethylene glycol and 1/10 cup water resulting in uniform dispersion.

EXAMPLE XXII

To 1/10 cup of vegetable oil floss from Example IX was added a previously prepared mixture of 1/8 cup glycerin USP and 1/8 cup water resulting in uniform dispersion.

EXAMPLE XXIII

In a graduated cylinder was placed 1 oz. of water. Vegetable oil fl ss prepared in Example VIII was compressed

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to 30-40 percent of its original as-spun volume, and 2 cups of the compressed floss were added to the water in the cylinder. It dispersed quickly forming a dispersion colloidal in appearance. In like manner 2 cups of similarly compressed mineral oil floss from Example VI, were added to the cylinder, immediately dispersing and forming a quite concentrated dispersion still colloidal in appearance. Finally, 2 cups of similarly compressed polyethylene glycol floss from Example X were added and it too entered the dispersed state. No agitation was used throughout to create the uniform blended dispersion.

Next, the graduated cylinder was placed in a microwave oven and heated on high for about 8 minutes until all evidence of evolving steam disappeared. The resulting de-hydrated thick mixture was permitted to cool and formed a solid mass that was slippery to the touch.

Finally, 1 oz. of water was added to the solid product in the graduated cylinder and within 3 minutes a dispersion was observed being formed. After 45 minutes all of the material was back in a dispersed state throughout the water.

The precise explanation for the phenomena implicit in the examples described herein is not known. It is conjectured that the sugar encapsulates minute, possibly molecular, quantities of the oil or other material altering its affinity for water or water containing substances. It has been established that pure water is not required as the dispersion medium as evidenced by the purely arbitrary selection of such mediums, in the following example.

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EXAMPLE XXIV

Separate beakers were provided respectively with 1/3 cup of (a) homogenized milk; (b) Diet "Coca Cola"; (c) "Pilsner" Light beer; and (d) water. To each beaker was added 1/3 cup of mineral oil floss from Example VI. In all the beakers the floss quickly entered the dispersed phase.

EXAMPLE XXV

Cocoa butter was mixed with sucrose in the ratio

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of 1 tablespoon c coa butter to 2 tablespoons sucrose and spun as in Example I. The resulting fiber was placed in a tub of hot water and immediately dispersed. After bathing in the tub the skin appeared very soft and neither oily nor sticky. Apparently, the presence of the oleaginous substance reduces the sticky quality of sucrose.

EXAMPLE XXVI

Cod liver oil, same as in Example VI, was mixed with sucrose, 1/8 cup of each, producing a viscous material. It was spun as in Example I and produced a very rich, heavy and obviously oily floss. A 1 oz. beaker was filled with a quantity of the floss, pressed down firmly. Then 1/4 oz. water was added and a thick dispersed system quickly developed.

EXAMPLE XXVII

This example is intended to demonstrate the universality of the phenomenon. First a sugar blend was produced by mixing by volume 40% lactose, 30% maltose and 30% sucrose with sufficient water to dissolve the sugars. The solution was placed in an oven at approximately 120°F. (48.8°C.) for a time sufficient to drive off the water. The residue was allowed to cool for about 2 hours and then broken into crystals for use in the spinning machine.

Using the sugar crystals, 1 teaspoon was mixed with 1 teaspoon of "Caswell Massey" pure lanolin and 1/8 teaspoon oil of violet fragrance. This mix was then spun into floss as in Example I. A nice floss was produced which when added to water produced a dispersion that could be used as a skin toner.

From the foregoing examples it can be concluded that spinning a substance with a sugar or sugars accomplishes a modification of the wettability of the substance with regard to other substances with which the first substance is neither normally miscible or readily dispersable therein. The process can end with the production of spun fibers which can be dispersed in water or a water containing fluid. Alternatively, a dispersion made

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from the fibers, or at least from material derived from the sugar-spun product, can be dehydrated to produce a solid which enters the dispersed state more readily than the original raw materials prior to treatment. For example, an oil or glycerin based throat medicament can be spun with sucrose or other sugar, form a dispersion with the addition of water, be dehydrated and fused to yield a solid which will have outstanding use as a throat lozenge. The nature of the sugar modified medicament is such that it will coat and line the mucous membranes of the oral cavity much more effectively than heretofore known forms of the medicament. Without the medicament the solid product, plus flavoring agents, becomes a confection.

The affinity developed between an oleaginous substance and water can be used to eliminate need for a surfactant or emulsifier in numerous formulating processes where such was heretofore required. One demonstrable example involves the elimination of the need for eggs in cake mix recipes. To illustrate the concept some examples follow.

EXAMPLE XXVIII

Into a mixing bowl was placed 2 tablespoons of flour. To this was added 4 tablespoons of water and 1 tablespoon of "Crisco" 100% Vegetable Oil. Attempts to mix the oil with the flour and water were unsuccessful until 1 whole egg was added.

EXAMPLE XXIX

Example XXVIII was repeated with the substitution for the pure vegetable oil of vegetable oil floss from Example VIII added in an amount equivalent to 1 tablespoon of the unmodified oil. The floss form of the oil mixed readily with the flour and water, all without the addition of egg.

EXAMPLE XXX

Next, three packaged cake mix s:

(a) "Betty Crocker" Super Moist Devils Food Cake

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Mix;

(b) "Duncan Hines" Golden Cak Mix; and

(c) "Pillsbury" Plus Yell w Cake Mix

were prepared. No eggs were used even though all directions
5 called for 3 eggs. Each recipe called for oil or margarine,
1/3 cup oil for (a) and (c), 1/2 cup margarine for (b).
Example XXIX demonstrated that the oil floss dispersed much
better than when egg was used with unmodified oil.
Consequently, the equivalent of one half the specified
10 amount of oil or margarine was used when pure oil was
replaced by the floss form. The mixes were each placed in a
bowl. The mixes (a) and (b) each received a quantity of the
vegetable oil floss from Example VIII. The quantity added
to mix (a) was the equivalent of 1/6 cup oil, to mix (b) the
15 equivalent of 1/4 cup oil. To mix (c) was added 1/3 cup
pure oil as called for. No floss was added to mix (c).
Next, the specified quantity of water was added to each and
the ingredients were mixed with an electric mixer. The
mixes (a) and (b) took in the water and other ingredients
20 completely, easily and without separation within the
recommended 2 minutes of mixing. However, the (c) mix mixed
only with difficulty and only after prolonged blending for
at least 6 minutes. All mixes were then baked in an oven
following the manufacturer's recommended directions, were
25 removed from the oven, and allowed to cool for 1 hour.

The mixes (a) and (b) produced cakes of excellent
texture that were evenly bound with no tendency to crumble.
The third mix, mix (c), could not be sliced, crumbled badly,
and was obviously not bound. It appeared that the oil and
30 water components had separated during baking.

The foregoing examples demonstrate that a dry
mixture can be prepared which disperses readily in an
aqueous environment even though one or more of the
individual constituents of the mixture normally lack
35 affinity for water or for one another. All that is required
is to separately mix each of the normally incompatible
constituents with at least one sugar capable of being spun
into fibers that are readily water-soluble and then
separately spinning the mixture to produce flosses which are

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subsequently blended with ne another.

While it has been stated above that it cann t be said with certainty that the present invention produces a true colloid, the evidence tends to indicate that the
5 oleaginous substance becomes encapsulated within the sugar, and that the molecules of each become so tightly attached that the sugar does not detach and enter solution when placed in water. Microscopic examination of solid masses produced as in Example XXIII suggests that a solid colloid
10 exists with the oil as the dispersed phase within the sugar as the dispersion medium. In an aqueous environment, the encapsulated molecules become the dispersed phase within the dispersion medium which is aqueous.

Having described the present invention with
15 reference to the presently preferred embodiments thereof, it will be apparent to those skilled in the subject art that various changes and modifications can be incorporated without departing from the true spirit of the invention as defined in the appended claims.

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WHAT IS CLAIMED IS:

1. A mass of spun fibers consisting essentially of one or more sugars where the sugars are capable of being spun into fibers that are readily water-soluble, and an ingredient that in its separate state is hydrophobic, said ingredient being distributed on or incorporated in the fibers of said mass such that said mass of fibers when added to water disperses therein to form a colloidal or colloidal-like dispersion.
2. A mass of spun fibers according to claim 1, wherein said ingredient is selected from the group consisting of olive oil, baby oil, cod liver oil, mineral oil, lard, vegetable oil, glycerin, cocoa butter, lanolin, and combinations thereof.
3. A mass of spun fibers according to claim 1, wherein said ingredient consists essentially of olive oil.
4. A mass of spun fibers according to claim 1, wherein said ingredient consists essentially of baby oil.
5. A mass of spun fibers according to claim 1, wherein said ingredient consists essentially of cod liver oil.
6. A mass of spun fibers according to claim 1, wherein said ingredient consists essentially of mineral oil.
7. A mass of spun fibers according to claim 1, wherein said ingredient consists essentially of a composition containing kelp, lecithin, vitamin B6 and cider vinegar.
8. A mass of spun fibers according to claim 1, wherein said ingredient consists essentially of a corn oil margarine composition.

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9. A mass of spun fibers according to claim 1, wherein said ingredient consists essentially of lard.

5 10. A mass of spun fibers according to claim 1, wherein said ingredient consists essentially of a motor oil composition.

10 11. A mass of spun fibers according to claim 1, wherein said ingredient consists essentially of vegetable oil.

15 12. A mass of spun fibers according to claim 1, wherein said ingredient consists essentially of cocoa butter.

13. A mass of spun fibers according to claim 1, wherein said ingredient consists essentially of an oleaginous substance.

20 14. A mass of spun fibers according to claim 1, wherein said ingredient consists essentially of lanolin.

25 15. A spun fibrous hydrophilic material comprising a mass of spun fibers of a sugar capable of being spun into fibers that are readily water-soluble and a hydrophobic ingredient distributed on or incorporated in said fibrous mass.

30 16. A method of rendering a hydrophobic substance hydrophilic which comprises the steps of mixing said substance with a sugar capable of being spun into fibers that are readily water-soluble and thereafter spinning said mixture with a centrifugal floss producing machine to yield a mass of hydrophilic fibers.

35 17. A method of rendering a hydrophobic substance dispersable in water which comprises the steps of mixing said substance with a sugar capable of being spun into fibers that are readily water-soluble, and thereafter

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spinning said mixture with a centrifugal floss producing machine to yield a mass of material that when added to water disperses therein to form a colloidal or colloidal-like dispersion.

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18. A method according to claim 17, wherein said substance is baby oil.

10 19. A method according to claim 17, wherein said substance is cod liver oil.

20. A method according to claim 17, wherein said substance is mineral oil.

15 21. A method according to claim 17, wherein said substance is a composition containing kelp, lecithin, vitamin B6 and cider vinegar.

20 22. A method according to claim 17, wherein said substance is a corn oil margarine composition.

23. A method according to claim 17, wherein said substance is lard.

25 24. A method according to claim 17, wherein said substance is a motor oil composition.

25. A method according to claim 17, wherein said substance is vegetable oil.

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26. A method according to claim 17, wherein said substance is cocoa butter.

27. A method according to claim 17, wherein said substance is an oleaginous substance.

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28. A method according to claim 17, wherein said substance is olive oil.

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29. A method according to claim 17, wherein said substance is lanolin.

30. A method of producing a dispersion which is colloidal or colloidal-like and contains water, an oleaginous substance, and a material that is soluble in water but lacks affinity for said substance, said method comprising the steps of mixing said material with said water to produce a solution, mixing said substance with a sugar capable of being spun into fibers that are readily water-soluble, thereafter processing said mixture of substance and sugar using a floss producing machine to yield a mass of product, and introducing said product into said solution thereby producing said dispersion.

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31. A method according to claim 30, wherein said material is glycerin.

32. A method according to claim 30, wherein said material is polyethylene glycol.

33. A method according to claim 32, wherein said oleaginous substance is selected from the group consisting of olive oil, cod liver oil, mineral oil, vegetable oil, baby oil, lard, cocoa butter, lanolin, and combinations thereof.

34. A method according to claim 31, wherein said oleaginous substance is selected from the group consisting of olive oil, cod liver oil, mineral oil, vegetable oil, baby oil, lard, cocoa butter, lanolin, and combinations thereof.

35. A colloidal or colloidal-like dispersion consisting essentially of water, at least one oleaginous substance, at least one sugar that is water-soluble, and optionally one or more adducts which in their separate state are soluble in water but lack affinity for said oleaginous substances.

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36. A colloidal or colloidal-like dispersion according to claim 35, wherein said oleaginous substances are selected from the group consisting of olive oil, cod
5 liver oil, mineral oil, vegetable oil, baby oil, lard, cocoa butter, lanolin, and combinations thereof.

37. A colloidal or colloidal-like dispersion according to claim 36, wherein said adducts are selected
10 from the group consisting of glycerin and polyethylene glycol.

38. A colloidal or colloidal-like dispersion according to claim 35, wherein said adducts are selected
15 from the group consisting of glycerin and polyethylene glycol.

39. A method of producing a dispersion which is colloidal or colloidal-like and contains water, an
20 oleaginous substance, and a material that is soluble in water but lacks affinity for said substance, said method comprising the steps of separately mixing said substance and said material each with at least one sugar capable of being spun into fibers that are readily water-soluble, thereafter
25 separately spinning said mixtures of substance and sugar and material and sugar using a centrifugal floss producing machine to yield respective masses of product, and introducing said products into a quantity of water thereby producing said dispersion.

30 40. A method according to claim 39, wherein said material is glycerin.

41. A method according to claim 39, wherein said
35 material is polyethylene glycol.

42. A method according to claim 41, wherein said oleaginous substance is selected from the group consisting of olive oil, cod liver oil, mineral oil, vegetable oil,

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baby oil, lard, cocoa butter, lanolin, and combinations thereof.

43. A method according to claim 40, wherein said oleaginous substance is selected from the group consisting of olive oil, cod liver oil, mineral oil, vegetable oil, baby oil, lard, cocoa butter, lanolin, and combinations thereof.

44. A method of producing a dispersion which is colloidal or colloidal-like and contains, in addition to water, at least one oleaginous substance, said method comprising the steps of mixing said substance with at least one sugar capable of being spun into fibers that are readily water-soluble, thereafter processing said mixture of substance and sugar using a floss producing machine to yield a mass of product, and introducing said product into a quantity of water thereby producing said dispersion.

45. A method according to claim 44, wherein said oleaginous substance is selected from the group consisting of olive oil, cod liver oil, mineral oil, vegetable oil, baby oil, lard, cocoa butter, lanolin, and combinations thereof.

46. A cake mix preparation including flour, at least one oleaginous substance, at least one sugar that is water-soluble, and one or more adducts that have affinity for water, where use of the mix requires blending with water or a water containing liquid, characterized in that said oleaginous substance and said sugar have been subjected to a blending and melt-spinning step rendering said oleaginous substance dispersable in water without the intervention of a separate surfactant.

47. A method of producing a solid body of a material that is autogenously dispersable in water or a water-containing medium which method comprises the steps of mixing an oleaginous substance with at least one sugar and optionally one or more adducts which are soluble in water

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but lack affinity for said oleaginous substance to produce a blend, then after spinning said blend using a centrifugal floss producing machine to yield a mass of fibrous product, combining said fibrous product with sufficient water to
5 create a dispersion with said product in a dispersed state within said water, applying to said dispersion heat at a sufficient level and for a sufficient time to eliminate at least the major portions of said water from said dispersion and to melt the residue, thereafter enabling said residue to
10 cool and solidify thereby forming said body.

48. A lozenge produced by the method of claim 47.

49. A confection produced by the method of claim 47.

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50. A method of stabilizing spun sugar which comprises in combination the steps of combining a quantity of an oleaginous substance with at least one sugar capable of being spun into fibers that are readily water-soluble and
20 thereafter processing said substance and sugar using a floss producing machine to yield a mass of spun fibers.

51. A method of producing a dry mixture which disperses readily in an aqueous environment although one or
25 more of the individual constituents of said mixture normally lack affinity for water or for one another, said method comprising the steps of separately mixing with each of said one or more constituents, at least one sugar capable of being spun into fibers that are readily water-soluble,
30 thereafter separately processing said mixtures of sugar and constituent using a floss producing machine to yield respective masses of product, and mixing together said products to produce a dry mix that readily mixes with an aqueous medium.

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52. A method according to claim 51, wherein at least one of said constituents is an oleaginous substance.

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53. A method according to claim 52, wherein said
oleaginous substance is selected from the group consisting
of olive oil, cod liver oil, mineral oil, vegetable oil,
baby oil, lard, cocoa butter, lanolin, and combinations
thereof.

54. A method according to claim 53, wherein at
least one of said constituents lacks affinity for an
oleaginous medium.

55. A method according to claim 52, wherein at
least one of said constituents lacks affinity for an
oleaginous medium.

56. A method according to claim 51, wherein at
least one of said constituents lacks affinity for an
oleaginous medium.

57. A method according to claim 52, wherein at
least one of said constituents is a glycerol.

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INTERNATIONAL SEARCH REPORT

International Application No. **PCT/US89/05109**

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) *		
According to International Patent Classification (IPC) or to both National Classification and IPC		
IPC ³ CO8L	1/00	
U.S. CL. 106/162		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
U.S.	106/162, 252/512, 425/9, 426/660, 426/556	
Documentation Searched other than Minimum Documentation to the extent that such Documents are Included in the Fields Searched ⁸		
III. DOCUMENTS CONSIDERED TO BE RELEVANT *		
Category ⁹	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
P X	US, A, 4,855,326, (Fuisz): 08 August 1989. (Note claim 23 "Cortico-steroid" is considered hydrophobic).	1-9 & 11-15
X	US, A, 717,756 (Morrison) 16 January 1903. (Morrison combines grated fruit with cotton candy).	16
T	US, A, 4,873,085 (Fuisz) 10 October 1989.	
A	US, A, 4,793,782 (Sullivan) 27 December 1988.	
A	US, A, 3,395,213 (Rieckmann et al) 30 July 1968.	
<div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p>* Special categories of cited documents: ¹⁰</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 48%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"A" document member of the same patent family</p> </div> </div>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search		Date of Mailing of this International Search Report
		08 MAR 1990
International Searching Authority		Signature of Authorized Officer
ISA/US		<i>Theodore Morris</i> Theodore Morris

FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

V. ☐ OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE¹

This international search report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1. ☐ Claim numbers _____, because they relate to subject matter¹² not required to be searched by this Authority, namely:

2. ☐ Claim numbers _____, because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out¹³, specifically:

3. ☐ Claim numbers _____, because they are dependent claims not drafted in accordance with the second and third sentences of PCT Rule 6.4(a).

VI. ☒ OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING²

This International Searching Authority found multiple inventions in this international application as follows:

Group 1, claims 1-15 a mass of spun fibers (Product),
claims 16-29 a method spinning fibers (Manufacture of
Product) and claims 30-34 & 39-45 introducing fibers into

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.
2. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:

3. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:

4. ☐ As all searchable claims could be searched without effort justifying an additional fee, the International Searching Authority did not invite payment of any additional fee.

Remark on Protest

- ☒ The additional search fees were accompanied by applicant's protest.
☐ No protest accompanied the payment of additional search fees.